

FOCUS ON RESIDENTIAL YARD TRIMMINGS

WCS						
Oct-04						
SUN	MON	TUES	WED	THU	FRI	SAT
						1
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Nov-04						
SUN	MON	TUES	WED	THU	FRI	SAT
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Dec-04						
SUN	MON	TUES	WED	THU	FRI	SAT
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Jan-05						
SUN	MON	TUES	WED	THU	FRI	SAT
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Feb-05						
SUN	MON	TUES	WED	THU	FRI	SAT
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Seasonality and Variability

Yard trimmings — including grass, leaves, brush, stumps, and limbs — are an extremely variable fraction of the waste stream. Weather and personal gardening schedules greatly impact weekly yard trimmings generation. Often, a household will generate a lot of yard trimmings one week, and less the next, during certain periods of the year only. In addition, residents tend to store up yard trimmings and place them in one large curbside setout, rather than setting them out in smaller amounts each week. These characteristics do not apply to other fractions of waste, which are generated much more consistently.

The WCS was intentionally designed not to overlap with periods in which DSNY collects yard trimmings from residents for composting. For example, sampling and sorting for the Fall WCS season was conducted before DSNY's Fall leaf collection period. The Fall results of the WCS therefore reflect the yard trimmings residents were throwing out during October and early November, as opposed to what they might have been storing up for the coming Fall leaf collection later in the month. Similarly, DSNY's collection of Christmas trees took place in January, while the Winter WCS season was in March.¹ The Winter results don't reflect Christmas trees at all, since by March anyone with a tree would have gotten rid of it, either during the tree collection period in January 2005, or otherwise.

In sum, the WCS provides insight into how much yard waste is currently being disposed of, as opposed to how much is diverted through DSNY composting collections. However, the fact that yard waste generation varies so much more

Mar-05						
SUN	MON	TUES	WED	THU	FRI	SAT
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20	21	22	23	24	25	26
27	28	29	30	31		

Apr-05						
SUN	MON	TUES	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May-05						
SUN	MON	TUES	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Jun-05						
SUN	MON	TUES	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Jul-05						
SUN	MON	TUES	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Aug-05						
SUN	MON	TUES	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

PWCS or WCS Sampling/Sorting
Leaf Collection
Xmas Tree Collection

¹ The Winter season had been planned for February but had to be postponed due to snow emergency.

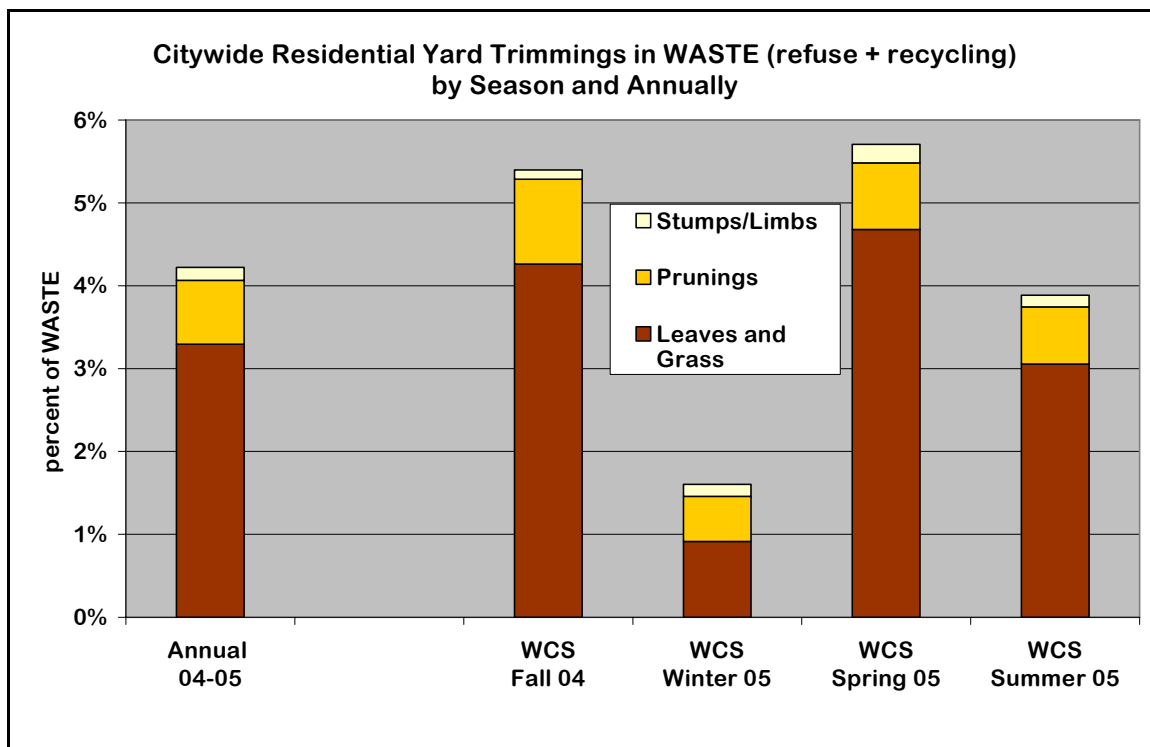
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than other materials, and the fact that some of it is collected separately in special DSNY collections, means that this segment of the WCS data is somewhat less precise.

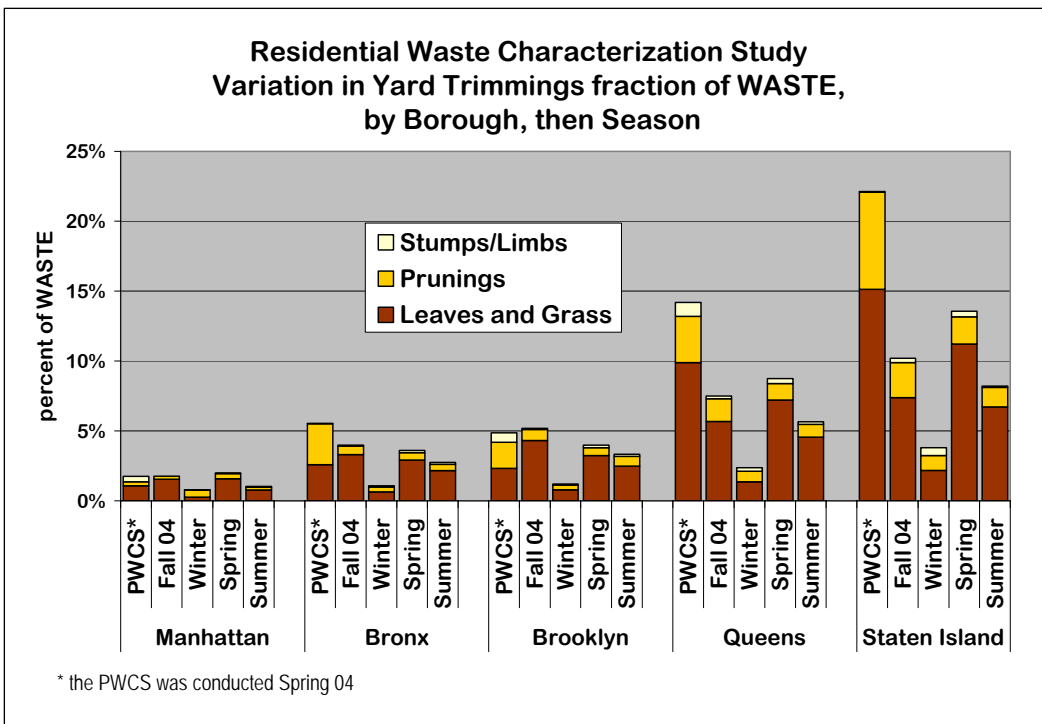
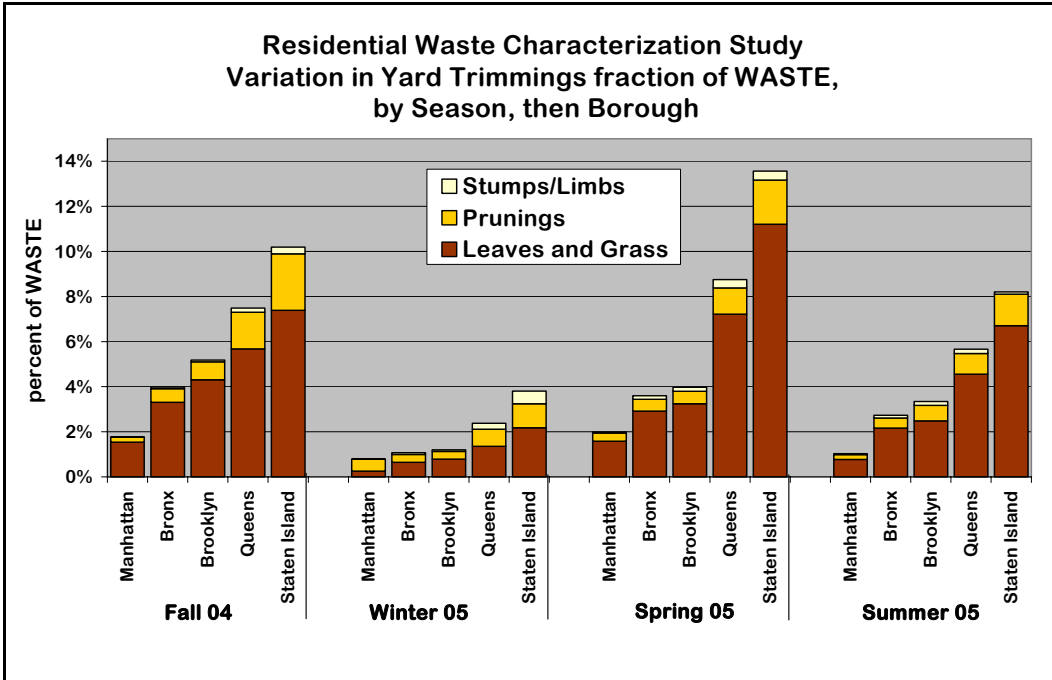
The approach of the WCS was to sort all samples — refuse, paper recycling, and MGP into the same categories. Three out of the 91 categories corresponded to yard trimmings: leaves and grass clippings, prunings, and stumps and limbs. Leaves were not sorted separately from grass clippings because of the extreme difficulty of separating these materials. However, visual observations confirm that in the Fall, leaves make up most of the yard trimmings that need to be disposed. In the Spring and Summer, both leaves and grass clippings predominate. As expected, very few yard trimmings were generated in the Winter.

To demonstrate the variation between seasons, the data on the three subcategories corresponding to yard trimmings is presented seasonally as well as annually in the table below.



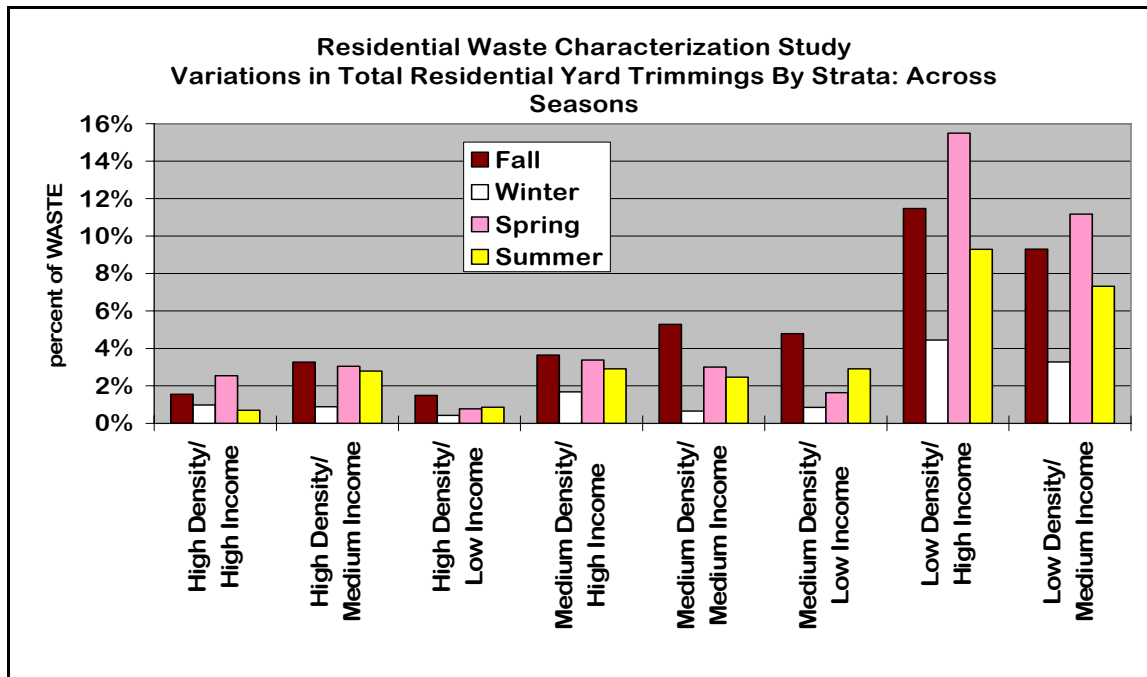
Another source of variability is the differences between the five boroughs in terms of housing density and available open space usually associated with leaves and yard trimmings. The tables below expand our understanding by showing yard trimmings percentages with this additional factor. The first table shows yard trimmings in the waste stream by season and borough, and the second table by borough and season to highlight the extent of variation that was found.

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Enough samples were taken so that yard trimmings composition could be also be calculated by housing density and income strata in the table on the following page. It is not surprising that the low density neighborhoods consistently generated more yard trimmings than medium or high density areas.

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Seasonal Yard Trimmings Generation

Fall Leaf Collections

The WCS estimates tell us the amount of yard trimmings that were thrown out as waste (either in the refuse, or to a much lesser degree with recycling) each season. It is important to distinguish these estimates from what we know about DSNY collections of leave for composting during the Fall leaf collection periods (late November to early December) in 37 of the City's 59 Community Districts. Those collections were not sampled during the WCS, and their tonnages do not form part of the generation estimates in the Waste Characterization Study.

The table on the next page compares the WCS's estimates of yard trimmings in residential waste to actual collections of Fall leaves. From the Fall WCS, we estimate a tonnage of a little over 3,500 tons a week of yard trimmings in waste; assuming a 13-week season, this translates to almost 47,000 tons for the Fall season. Out of that total, over 15,800 tons were collected in the Fall of 04, and 12,300 tons in the Fall of 05 by DSNY trucks. In other words, the Department's Fall leaf collections captured 34% of estimated yard waste generation in the Fall of 2004, and around 26% in the Fall of 2005.

There are several reasons why these capture rates are lower than those for curbside recycling of paper, metal, glass and plastic. In comparison to those materials, fall leaves are generated in lower volumes, less consistently, and by only a subset of residents. If DSNY trucks were deployed throughout the entire fall season, they would collect relatively little tonnage on a daily basis even if truck routes were extended to the maximum serviceable in one workday. Large numbers of trucks, and

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the labor costs, fuel demand, traffic, and emissions that go along with them, would be on the road to collect relatively few leaves. To collect efficiently it is necessary to limit the weeks of leaf collection to four and to ask residents to stockpile leaves for collection during those periods. The efficiency gains from this approach have benefits that outweigh the lower capture rates achieved.

YARD TRIMMINGS TONNAGES, FALL SEASON					
	Percent Waste Composition	estimated weekly tonnage in waste	estimated seasonal tonnage in waste (assuming 13 week season)	actual leaf collections, total tonnage collected over 4 weeks	
				November - December 04	November - December 05
Fall WCS, October - November 04					
Manhattan	1.8%	217.0	2,820.8	-	-
Bronx	4.0%	376.2	4,890.7	161.4	103.9
Brooklyn	5.2%	1,059.7	13,776.5	2,722.4	1,973.9
Queens	7.5%	1,405.3	18,268.9	8,721.9	7,400.9
Staten Island	10.2%	525.0	6,825.1	4,246.0	2,866.3
Citywide	5.4%	3,583.2	46,582.0	15,851.6	12,345.0

Winter Tree Collections

We can do a similar calculation to compare Winter yard trimmings in waste to the amount of Christmas trees collected in January after the holiday season. As explained above, the Winter WCS, which was conducted in March, could not have measured the highly seasonal fraction of Christmas tree waste generated citywide each January. So we have two sets of statistics. Citywide, the WCS calculates over 12,000 tons of yard trimmings were disposed of during the Winter; and about 1300 tons of Christmas trees were collected right after the holidays.

YARD TRIMMINGS TONNAGES, WINTER SEASON					
	Percent Waste Composition	estimated weekly tonnage in waste	estimated seasonal tonnage in waste (assuming 13 week season)	actual holiday tree collections, total tonnage collected over 1 week	
				January 05	January 06
Winter WCS, March 05					
Manhattan	0.8%	93.3	1,212.9	312.3	327.0
Bronx	1.1%	94.8	1,232.5	89.6	95.1
Brooklyn	1.2%	221.5	2,878.9	318.2	298.1
Queens	2.4%	389.7	5,066.6	399.1	356.5
Staten Island	3.8%	165.5	2,151.7	244.1	208.6
citywide	1.6%	964.4	12,542.5	1,363.3	1,285.3

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Spring and Summer – no special collections

In contrast to Fall and Winter, there are no special DSNY collections of yard trimmings in the Spring or Summer. What we know about seasonal generation is therefore solely from the PWCS and WCS. The table below illustrates actual composition data for Spring and Summer per borough, along with estimated weekly and seasonal generation rates.

YARD TRIMMINGS TONNAGES, SPRING AND SUMMER SEASONS									
	Percent Waste Composition			Estimated weekly tonnage in waste			Estimated seasonal tonnage in waste (assuming 13 week season)		
	PWCS, May and June 04	Spring WCS, May 05	Summer WCS, August 05	PWCS, May and June 04	Spring WCS, May 05	Summer WCS, August 05	PWCS, May and June 04	Spring WCS, May 05	Summer WCS, August 05
Manhattan	1.8%	2.5%	1.0%	221.6	239.6	118.2	2,880.6	3,115.3	1,536.7
Bronx	5.5%	4.1%	2.7%	581.0	347.7	260.4	7,552.7	4,520.0	3,384.7
Brooklyn	4.9%	4.8%	3.3%	530.2	812.0	655.8	6,892.3	10,555.7	8,524.8
Queens	14.2%	10.7%	5.7%	1,484.0	1,721.5	1,088.6	19,292.3	22,380.1	14,151.8
Staten Island	22.1%	16.8%	8.2%	1,372.3	787.5	432.6	17,840.5	10,237.9	5,624.2
Citywide	8.3%	5.7%	3.9%	4,189.1	3,907.1	2,550.9	54,458.4	50,792.2	33,161.6

Future Yard Waste Diversion Projection

Using results from the WCS, we can also predict the increase in yard trimmings tonnage that would have to be handled by DSNY composting facilities if leaves and other trimmings were banned from collection with refuse. Various proposals have been made to require either resident or landscaper generated yard trimmings to be diverted to DSNY composting sites. Under this generic scenario, and assuming a 90% capture rate in compliance with a new law, DSNY's existing facilities would be facing a tonnage that would overwhelm existing capacity, but would add about four points to the diversion rate:

Tonnage By Season		x 90%	impact on diversion rate*
Fall	46,582.0	41,923.82	1.2%
Winter	12,542.5	11,288.26	0.3%
Spring	50,792.2	45,712.99	1.3%
Summer	33,161.6	29,845.46	0.9%
Annual	143,078.4	128,770.5	3.8%
* assuming a baseline waste generation total of 3.4 million tons			

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